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CASE REPORT

Nonoperative management of gunshot liver trauma in a severely injured patient

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Case report

A 34-year-old woman was admitted to our hospital suffering from multiple gunshot wounds to the abdomen, thorax, head, neck and left arm. Endotracheal intubation was performed on scene and volume resuscitation started. According to our trauma management protocol, the haemodynamically stable patient receives a whole body contrast enhanced computed tomography (CT) after initial diagnostics and treatment in the Emergency Department.[3] CT images showed a severe longitudinal rupture of the liver (segments IVa, VII and VIII) with only minimal amounts of intraabdominal fluid (Fig. 1). Arterial and portal venous perfusion as well as the venous outflow of the liver was normal. According to the organ injury scale of the American Association for the Surgery of Trauma, the patient was suffering a grade III liver injury.[4] Images of the cervical region showed an interruption of the vascular integrity of the right carotid artery as well as a minor mandibular fracture. Furthermore, a bilateral haemopneumothorax and a distal fracture of the left radius and ulna were found. Results of the CT were correlated to the clinical course of the patient and priority was given to a mini thoracotomy and insertion of chest tubes. Increased swelling of the neck and progressive anisocoria led to emergency surgery for the carotid artery injury. Given that the patient was haemodynamically stable, conservative treatment of the liver trauma was the most appropriate treatment option. Surgical exploration of the neck revealed a complete rupture of the carotid artery and a perforation of the cervical oesophagus by the bullet. The carotid artery and its bifurcation were first reconstructed using a human arterial graft from the supply commonly used for challenging reconstructions in transplantation surgery. After retrieving the projectile out of its endoluminal position, a nasogastric tube was placed and the wound in the oesophagus was closed. The mandibular fracture was treated by wire immobilization for 3 weeks while the lower arm fracture was treated with osteosynthesis. The patient recovered to a stable condition without neurological deficits allowing discharge from the intensive care unit within 1 week.

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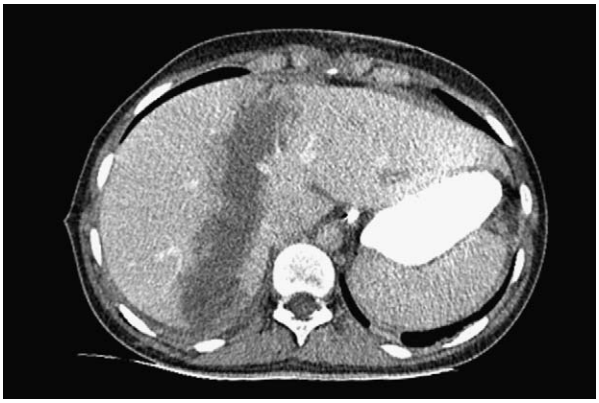

Figure 1 CT image of the gunshot injury to liver segments IVa, VII and VIII at the day of trauma.

Laboratory results normalised over the course of hospital stay; no clinical signs of pancreatitis or liver insufficiency were detected. Overall, the patient suffered no secondary liver complications. No abscess, extended necrosis, bile leakage, vascular occlusion or rupture was detected by follow-up CT scan on days 10 and 28 after the initial trauma. No wound infections developed in the surgically exposed regions. Due to the additional psychological trauma of being her husband's victim, the patient was treated in hospital for 33 days, but was in good health during a follow-up visit 6 months after trauma.

Discussion

Advances in trauma management favour nonsurgical treatment of penetrating abdominal injuries in many cases.[1] On the contrary, where there is haemodynamic instability a surgical approach is usually needed to manage blunt or penetrating trauma.[2,4] Surgical strategies depend on the abdominal injuries and projectile path (angle, intrusion and exit wounds). Operative exploration and subsequent reconstruction are mandatory if an increasing volume of free abdominal fluid or perforating trauma to the bowel is suspected. In this multiply injured gunshot patient, the life threatening injury to the carotid artery had first priority. Follow-up ultrasound and CT images 10 h after admission still showed only minimal perihepatic fluid although the images demonstrated complex liver trauma. With no clinical signs of bowel perforation or developing peritonitis, the decision to conservatively manage the liver injury was made. Severely injured patients suffering combined lesions of the abdomen, thorax and head usually have a poor prognosis and therefore, unnecessary surgery should be avoided.[1,3]

This case clearly demonstrates that conservative treatment of major penetrating trauma to the whole liver can be an adequate treatment option.

References

1. Kleppel NH. The genesis of nonoperative management of penetrating abdominal trauma. Arch Surg 2004;139:800—1.
2. Leppaniemi AK, Salo JA, Haapiainen RK. Civilian low velocity gunshot wounds of the liver. Eur J Surg 2002;160:663—8.
3. Ruchholtz S, Waydhas C, Schroeder T, Piepenbrink K, Kuhl H, Nast-Kolb D. The value of computed tomography in the early treatment of seriously injured patients. Chirurg 1994;73: 1005—12.
4. Strong RW, Lynch SV, Wall DR, Liu CL. Anatomic resection for severe liver trauma. Surgery 1998;123:251—7.